UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/843,269	04/26/2001	Keith Gary Boyer	00-111-TAP/STK 00111 PUS	9705

7590 10/19/2004	EXAMINER
Timothy R. Schulte	CHAUDRY, MUJTABA M

Timothy R. Schulte
Storage Technology Corporation
One StorageTek Drive, MS-4309
Louisville, CO 80028-4309

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/843,269	BOYER ET AL.
	Examiner	Art Unit	
	Mujtaba K Chaudry	2133	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Drawings

The corrected or substitute drawings were received on June 16, 2004. These drawings are

accepted.

Response to Amendment

Applicant's arguments/amendments with respect to amended claims 1-5 and 7, original claims 6

and 8-11, and newly added claim 12 filed June 16, 2004 have been fully considered but are not

persuasive. The Examiner would like to point out that this action is made final (See MPEP

706.07a).

Applicant contends, "...Senshu fails to provide recording error correction codewords

segments in an interleave dynamically created to correspond only to the portion of the matrix

filled by user data." The Examiner respectfully disagrees. Senshu teaches to enhance the error

correction capability in order to cope with errors due to the influence of dust particles or

scratches on the optical disc surface onto due light beam. To enhance the error correction

capability, codes are increased or the ECC block is increased. Moreover, there is proposed a

method of interleaving and collectively blocking the error correction codes in order to broaden

the ECC block to the size equivalent to one track on the inner circumference of the disc. If

blocked codes are used, a block size of not smaller than 64 KB can be constituted as user data

even when general $GF(2^8)$ is used as codes. An optical disc recording/reproducing method,

an optical disc and an optical disc device in which address information is provided as a part of

data within a frame so that a common data format is used for both a read-only disc and a

recordable disc. According to this technique, in a block format determined as shown in FIG. 3,

the code length of the ECC block is 196 (172 information words and 24 parity words), the

interleave length is 384, the number of sectors in this block is 16, the number of frames per

sector is 49, the number of data within a frame is 96, and the user data per sector is equivalent

to 4 KB. The data of 24 bytes within the leading frame of each sector is address information.

The direction of data on the disc corresponds to frames 0, 1, 2, . . . , 783 (blocks=total sectors).

In the block format shown in FIG. 3, the interleave length is long in comparison with the frame

length, and the header data of each frame is not on the same code but is concentrated at one of

the four codes. Therefore the Examiner would like to point out that Senshu teaches to recording

error correction codewords segments in an interleave dynamically created to correspond only to

the portion of the matrix filled by user data.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness
    or nonobviousness.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Senshu (USPN

6349400 B1).

As per claims 1 and 7, Senshu substantially teaches (title and abstract) a data
recording/reproduction method and apparatus that is carried out in a disc format such that error
correction codes interleaved with respect to the direction of data on a disc are collectively
blocked into an error correction unit and that the input/output order of user data in an ECC block
as an error correction unit is made coincident with the direction of processing of the error
correction codes. Thus, coding can be started at the time when necessary data for generating one
code is transmitted, without waiting for transmission of data for one ECC block. Transmission
of user data can be started at the time when correction of one code is completed, without waiting
for completion of correction operation for one ECC block. Also, since the direction of correction
codes is the same as the direction of user data, no memory for rearrangement of data is required
and the hardware structure can be minimized. The data transmission/reception takes place
between the buffer memory and the external device, bus arbitration can be easily carried out.
Furthermore, Senshu teaches (col. 24, lines 17-64) an optical disc recording/reproducing method
comprising the steps of rotating an optical disc at a predetermined type of constant velocity and
carrying out data recording/reproduction in a disc format such that error correction codes
interleaved with respect to the direction of data on a disc are collectively blocked into an error
correction unit and that the input/output order of user data in an ECC block as an error correction
unit is made coincident with the direction of processing of the error correction codes. The data
recording/reproduction is carried out in a disc format such that the ECC block is constituted by
one or more sectors, the sector is constituted by a plurality of frames. Senshu teaches that the
data recording/reproduction may be carried out in a plurality of disc formats having different
ECC block sizes in accordance with the setting of the number of sectors and interleave length.

Senshu teaches the data recording/reproduction may also be carried out in a disc format such that the number of data within the segment is smaller than the number of data within the frame and that the correction code position is updated for each segment while the interleave rule is met in causing the data position on the disc to correspond to the data position on the ECC block.

Senshu does not explicitly teach to determine the size of the user data and the amount of matrix that will be filled by the received user data as stated in the present application.

However, Senshu teaches (col. 7, lines 4-51) the data recording/reproduction is carried out in a plurality of disc formats having different ECC block sizes in accordance with the setting of the number of sectors and interleave length. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a determining means to determine the size of the user data before recording within the data recording method and apparatus of Senshu. This modification would have been obvious to one of ordinary skill in the art because one of ordinary skill in the art would have recognized that determining the size of the memory matrix before recording would enable accurate recording and therefore reduce time.

As per claims 2 and 8, Senshu substantially teaches, in view of above rejections, (col. 7, lines 45-52) data recording/reproduction is carried out, for example, in a disc format such that the number of user data within the segment is smaller than the number of data within the frame and that the correction code position is updated for each segment while the interleave rule is met in causing the data position on the disc to correspond to the data position on the ECC block.

As per claims 3-4, 9-10 and 12, Senshu substantially teaches, in view of above rejections, (col. 10, lines 2-65) causing the data position on the ECC block on the assumption that the code length is an odd number while the number of data within the segment is smaller than the number

of data within the frame, a disc format is used such that the correction code position is updated for each segment while the interleave rule is met. Thus, the one-to-one correspondence between the data on the disc and the data on the ECC block can be realized.

As per claims 5-6 and 11, Senshu substantially teaches, in view of above rejections, (col. 7, lines 45-52) data recording/reproduction is carried out in a disc format such that the number of user data within the segment is smaller than the number of data within the frame and that the correction code position is updated for each segment while the interleave rule is met in causing the data position on the disc to correspond to the data position on the ECC block. Furthermore, Senshu teaches, as stated previously, causing the data position on the ECC block on the assumption that the code length is an odd number while the number of data within the segment is smaller than the number of data within the frame, a disc format is used such that the correction code position is updated for each segment while the interleave rule is met. Thus, the one-to-one correspondence between the data on the disc and the data on the ECC block can be realized. The Examiner would like to point out that while Senshu only teaches the writing aspect of data to a recording medium with the interleave technique, reading the data would be done a similar but reverse manner and therefore would have been obvious embodiment of Senshu.

The Examiner disagrees with the Applicant and maintains rejections with respect to amended claims 1-5 and 7, original claims 6 and 8-11, and newly added claim 12. All arguments have been considered. It is the Examiner's conclusion that amended claims 1-5 and 7, original claims 6 and 8-11, and newly added claim 12 are not patentably distinct or non-obvious over the prior art of record. Furthermore, newly added claim 12 is shown to be rejected herein above.
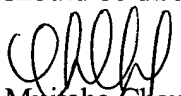
Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action. The prior art made of record and not relied upon is considered pertinent

to applicant's disclosure.

Any inquiries concerning this communication should be directed to the examiner,

Mujtaba Chaudry who may be reached at 703-305-7755. The examiner may normally be reached

Mon – Thur 7:30 am to 4:30 pm and every other Fri 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, please contact the

examiner's supervisor, Albert DeCady at 703-305-9595. The fax phone number for the

organization where this application is assigned is 703-746-7239.

Any inquiry of general nature or relating to the status of this application or proceeding

should be directed to the receptionist at 703-305-3900.

Mujtaba Chaudry
Art Unit 2133
October 12, 2004

Guy J. Lamarre
PRIMARY EXAMINER